

Abstract of the Disclosure

A multidirectional audio decoder using an "adaptive" audio matrix derives at least one of a plurality of output audio signals from two or more directionally-encoded audio input signal streams ($S_1(\alpha)$, $S_2(\alpha)$, ... $S_N(\alpha)$, wherein α is the encoded angle of a source audio signal. Each
5 output signal is associated with a principal direction β . In order to generate each output signal, a pair of intermediate signals ("antidominant" signals) are generated, constituting the antidominant signal for each of the two adjacent principal output directions of the decoder. The antidominant signal for any arbitrary principal (or "dominant") direction is the combination of input signals having coefficients such that the combination goes to zero for that dominant direction.

10 Amplitude control is applied to the two antidominant signals to deliver a pair of signals having substantially equal magnitudes that are additively or subtractively combined to provide the output audio signal associated with a principal direction. The pair of signals that are combined include passive matrix components. In an alternative embodiment, passive matrix components for the output signal are derived instead by applying the input audio signals to a passive matrix
15 and by combining the passive matrix components with pairs of amplitude controlled versions of the antidominant signals that do not include passive matrix components. For sources from one direction at a time, there is little or no unwanted crosstalk into outputs that should be silent (*i.e.*, there is substantially no signal in outputs other than the two representing directions adjacent to the desired direction, except when the desired direction happens to correspond to that of an
20 output, in which case there is a signal in substantially only that output).